

THE DISTINCTION OF SCIENCE-CONTEXTUALIZED PROBLEMS ON
COMPUTATIONAL FLUENCY

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Abstract

In this article, I mentioned about a quantitative research studied by M. Sencer Çorlu and Robert M. Capraro in Texas A&M University. The study researched the relationship between science-contextualized drill exercises and computational fluency. The main finding of the research was that the gains for both middle and high school students' computational fluencies were higher in the science-contextualized drill exercises than in the traditional context-free drill exercises. With basing on this study, I supported that in order to improve students' computational fluency, science-contextualized drill exercises were better in mathematics teaching than traditional drill exercises.

Key Words: Science-contextualized, computational fluency, traditional drill exercise

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THE DISTINCTION OF SCIENCE-CONTEXTUALIZED PROBLEMS

Introduction

The purpose of this article was to investigate both sides of math wars and to help people decide which side of them they wanted to be in. First, I summarized a study of M.S. Çorlu and R. M. Capraro in this area. The study researched the relationship between science-contextualized drill exercises and computational fluency. Then, in the light of this study, I claimed that science-contextualized problems were better than traditional drill exercises for the improvement students' computational fluency.

A Study: Computational Fluency

According the study of M. Sencer Çorlu and Robert M. Capraro in Texas A&M University and M. Ali Çorlu in İstanbul Commerce University, there was a relationship between science-contextualized problems and computational fluency. The coauthors explored the nation of computational fluency by testing an instructional method implemented as a non-traditional drill exercise. This was quantitative methods research which was published as "*Developing Computational Fluency With The Help of Science: A Turkish Middle and High School Grade Study*" in the Turkish Online Journal of Educational Technology (2011). The authors intended to understand the two controversial sides of the math wars in the theoretical framework. The first one was if the science-contextualized drill practices improved students' computational fluency better than traditional drill practices. And, the second side was if there was any statistical significance between middle and high school students in terms of their benefit from science-contextualized practices. In this manner, at the end of the study, Çorlu and Capraro reached a consequence that the gains for both middle and high school students' computational fluencies were higher in the science-contextualized drill exercises than in the traditional context-free drill exercises. This was the main finding of the research.

THE DISTINCTION OF SCIENCE-CONTEXTUALIZED PROBLEMS

In Which Side of The Math Wars Are You?

What is computational fluency? Computational fluency was defined by NCTM as having and using efficient and accurate methods for which students can use computations in a variety of methods by using mathematically sound algorithm(2000). However, teachers are left in between two sides of the math wars which are conceptual side and computational side of teaching mathematics which is a controversial issue (Galley & Manzo, 2004). Although the opponents of the proposal may argue that algorithmic computations in teaching are more helpful for students, I propose that science-contextualized problems have a more noteworthy role on the mathematics education. Since, the science-contextualized problems would help the students to compare their answers with their everyday experiences and they would gain the ability of mathematical thinking and integrate this knowledge in most areas of mathematics, such as algebra, problem solving and geometry.

The science-contextualized drill practices improve students' computational fluency because students can compare and contrast their results with their experiences. As Alfred North Whitehead said, "Mathematics is a way of learning about general ideas which increases our understanding of the universe."(1861-1947). In addition, with respect to Cobb, an individual's arithmetical activity effects one's cultural practices such as completing worksheets in school, shopping in a supermarket, selling candy on the street(1994).

The science-contextualized problems has a positive effect on students' computational fluency due to development of mathematical thinking and using this thought in problem solving, for example. Carefully sequenced problems can introduce students to new subject matter, and provide a context for discussions. Hence, this kind of problem solving instruction provides students a "mathematical tool kit" as well as the facts they have experienced (Schoenfeld, 1992,

THE DISTINCTION OF SCIENCE-CONTEXTUALIZED PROBLEMS

p.13). Moreover, in the spirit of Polya, "Problem solving is learning to grapple with new and unfamiliar tasks, when the relevant solution methods are not known."(1845).

Conclusion

The purpose of this article was to explain the distinctions of science-contextualized problems on computational fluency. In this manner, I mentioned about a quantitative research studied by M. Sencer Çorlu and Robert M. Capraro in Texas A&M University. With basing on this study, I insisted on that in order to improve students' computational fluency, science-contextualized drill exercises should be chosen in mathematics teaching rather than traditional drill exercises. In addition, Curricular Focal Points, in 2006, supported the argument that teaching mathematics should be based on conceptual understanding with an emphasis on computational fluency(NCTM).

THE DISTINCTION OF SCIENCE-CONTEXTUALIZED PROBLEMS

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